NURSE REPORT

OCCUPATIONAL HEALTH BRANCH
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NURSE REPORT #3 **TRACTOR DRIVER CRUSHED BY SCRAPER-ROLLER CDHS(COHP)-FI-92-005-03**

Summary

A tractor driver was towing a scraper and a roller through a walnut orchard. The ground in walnut orchards is graded and packed in this way before the nuts are harvested. The driver was probably looking over his shoulder to guide the equipment he was towing when he drove under a low tree branch. The branch knocked him off the back of the tractor. The tractor continued moving forward and dragged the scraper and then the roller over the driver. His chest was crushed and he bled to death on the scene.

How could this death have been prevented?

-By trimming the branches along the rows where the tractor is driven.

-By checking the rows for low branches before driving the tractor down them.

-By equipping the tractor with a roll-over protection device, cage, or shield to deflect low-lying branches.

-By requiring the tractor driver to wear a seat belt.

-By having an automatic shut-off so that a tractor without a driver cannot move forward.

CASE 191-010-01 May 22, 1992

The NURSE (Nurses Using Rural Sentinel Events) project is conducted by the California Occupational Health Program of the California Department of Health Services, in conjunction with the National Institute for Occupational Safety and Health.

The program's goal is to prevent occupational injuries associated with agriculture. Injuries are reported by hospitals, emergency medical services, clinics, medical examiners, and coroners. Selected cases are followed up by conducting interviews of injured workers, co-workers, employers, and others involved in the incident. An on-site safety investigation is also conducted. These investigations provide detailed information on the worker, the work environment, and the potential risk factors resulting in the injury. Each investigation concludes with specific recommendations designed to prevent injuries, for the use of employers, workers, and others concerned about health and safety in agriculture.

BACKGROUND

A California Occupational Safety and Health Administration (Cal/OSHA) district compliance office reported a tractor-related fatality at an orchard in California to NURSE staff in December, 1991. A Senior Safety Engineer from the NURSE project conducted an on-site investigation on December 18, 1991 and discussed the incident with the manager of the farm. The Cal/OSHA report and photographs of the incident scene were obtained from the local Cal/OSHA office with the farm owner's consent.

This incident occurred in a large farm corporation with 40 full time employees and a full- time designated safety director. The farm's primary crop is walnuts. After the incident the Cal/OSHA inspector reviewed the corporation's written injury prevention program and noted that it complied with Title 8 California Code of Regulations 3203 -- Injury and Illness Prevention Program. (As of July 1, 1991 the State of California requires all employers to have a written seven point injury prevention program: 1. designated safety person responsible for implementing the program; 2. mode for ensuring employee compliance; 3. hazard communication; 4. hazard evaluation through periodic inspections; 5. injury investigation procedures; 6. intervention process for correcting hazards; and 7. a health and safety program.)

INCIDENT

On August 14, 1991 at approximately 5:00 p.m. a 35 year old male Hispanic farm tractor driver sustained a fatal injury after being knocked off the tractor he was driving and run over by a scraper and roller combination he was towing behind the tractor. The tractor driver was working alone, preparing the ground in a walnut grove prior to mechanical harvesting of the walnuts. The ground must be as level as possible for the walnuts to be swept up after they are mechanically shaken from the trees. The tractor driver wore safety glasses and a baseball style cotton hat. The estimated speed of the tractor was 1½ miles per hour. Apparently the driver looked back over his shoulder in order to check the scraper and roller and was struck on his head by a low limb, which knocked him off the tractor. He was then rolled over by the scraper and then the roller. A tree with a set of low lying branches which were extending into the work row between the trees was identified as the possible object that hit the driver; these branches were in the direct path of the driver and were low enough to knock him off the tractor. One limb was torn from the supporting branch and was discolored where he must have struck his head.

The driver was found dead at the scene at around 5:45 - 6:00 p.m. by co-workers who noticed his vehicle was still parked outside the farm shop. His body was found 30 feet down the row from the low lying branches. The tractor was further down past the location of the driver. The tractor was not running but the ignition was on and it was in first gear.

A deputy coroner pronounced the tractor driver dead on the scene. The autopsy revealed multiple rib fractures which had lacerated the driver's liver and caused him to bleed to death. (Exsanguination from multiple liver lacerations.) His neck was also dislocated.

PREVENTION STRATEGIES

1. The work environment (i.e., the orchard) should be free of hazards for anyone working there. Part of routine orchard maintenance includes trimming back the trees; these trees had their branches near the rows trimmed and tipped in early June or July (six weeks before the incident). However, because of the

weight of the walnuts some branches were hanging down into the rows of trees. One of these low lying branches was low enough to knock this tractor driver off. After this death, the farm owner in this incident required that employees carry a small saw on the tractor and stop and cut back limbs which overhang the rows. If this procedure had been initiated and followed by this tractor driver, he might not have been knocked off of the tractor and subsequently killed. An alternative approach would be to require the driver (or another employee) to walk through the rows and cut off branches before the tractor entered that row.

2. Tractor drivers should be protected from being struck by low lying limbs and branches when driving through an orchard. The California Code of Regulations has a special section on Roll-over Protection Structures[1] which permits low-profile tractors (i.e., 18" or less from ground to transmission) used for work in an orchard, farm building, greenhouse, etc. to not have a rollover protection system (ROPS). A ROPS on this tractor could possibly have deflected the branch and prevented the driver's death. After the death discussed in this incident the farm owner designed and built a steel driver's cage with steel mesh screen onto one tractor. This tractor was tested by employees and subsequently modified to be more acceptable to the tractor drivers. This became the model for a second cage which was constructed for the tractor involved in this incident. Because this tractor was retrofitted with a rollover protection system the cage was clamped to a portion of the ROPS and welded to the tractor frame. A seat belt was installed at the time of the ROPS as required by state law.[2]

3. Fiber glass shields are available commercially and may be installed on tractors to prevent drivers from being hit by branches. However, these are not popular with farm owners because they do not last more than one growing season. This demonstrates the importance of the acceptability of an intervention. It is becoming more common for growers to design and build cages for the driver because of the lack of acceptable commercially manufactured devices.

4. When a rollover protection system is not installed a seat belt is not mandated.[3] However, in this incident if the driver had been wearing a seat belt he would not have been knocked off of the tractor and run over by the scraper and roller even if he was hit by the branch. Therefore, it is recommended that all employers install, and maintain in good working condition, seat belts and ROPS on all tractors. Employees should be required and educated to always use the seat belt while driving the tractor.

5. This death occurred because after the driver was knocked off the tractor he was run over by a scraper and roller being pulled behind the tractor. Once the driver was knocked off, the tractor moved ahead by itself. If the tractor had a mechanism where by the tractor would stop when a driver is not in the seat, the driver would not have been run over and been fatally injured.

6. The driver was struck by a branch while he was looking behind to check the operation of the roller and scraper as it moved through the rows of the orchard. This operation is typically done alone and requires frequent checking of the towed implement. In this incident if the driver had a rear view mirror which he could use to check the towed implement without turning his head he may have seen the low branch and not have been knocked off and subsequently run over.

1. California Code of Regulations T8 CCR 3651 Agricultural and Industrial Tractors (a) Exceptions.
2. California Code of Regulations T8 3653 - Seat Belts.
3. California Code of Regulations T8 3653 - Seat Belts.